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REDESCRIPTION OF A MAURITIAN APHID OF THE GENUS *AMPHOROPHORA* BUCKTON (HOMOPTERA).

By Raymond Mamet.
(*Rose Hill, Mauritius.*)

Amphorophora wikstroemiae Mamet.[1]

Amphorophora phyllanthi-wikstromiae Mamet, 1939, *Maur. Inst. Bull.* **1** : 49.

This species, which was described as a variety of *Amphorophora phyllanthi* Takahashi (1937, *Konowia* **16** : 93–96, fig. 2), has recently been studied by the author with a view to supplementing its short original diagnosis. The author, after carefully comparing his types of *wikstroemiae* with cotypes of *phyllanthi*, has arrived at the conclusion that the two insects could be separated from one another by certain characters which could be considered sufficient to warrant the raising of this variety to specific rank.

Amphorophora wikstroemiae Mamet.

Apterous viviparous female (fig. 1, *a*).

In specimens treated with KOH: Head, pronotum, mesonotum, metanotum and abdominal segments showing no trace of sclerotization dorsally, whereas in *phyllanthi* (fig. 1, *h*) certain areas of these regions are faintly sclerotized. Dorsum of abdominal segments with many transverse rows of minute spinules, as in *phyllanthi*. Cornicles black; cauda paler; distal quarter of femora and tibiae and tarsi dusky, as in *phyllanthi*. Body oval, about twice as long as broad in mounted specimens. Dorsum not reticulated whereas in *phyllanthi* the sclerotized patches of the dorsum are reticulated; with minute setae. Head (fig. 1, *b*) not imbricated; without granules and a median line; with a few, very small dorsal setae, as in *phyllanthi*. Frontal tubercles similar to those of *phyllanthi*: Very short, scarcely developed, very slightly convex on mesal side. Frons very slightly convex at middle. Eyes normal. Antennae very long, slender, with some very short setae; the relative lengths of segments approximately as follows: III, 28; IV, 22; V, 20; VI, 7 + 23. In *phyllanthi*, the corresponding lengths, on the same scale, as follows: III, 29; IV, 17; V, 14; VI, 7 + 23. Segment I wider than long; segment II a little longer than wide and a little shorter than segment I, with a small roundish pore near apical margin; segment III (fig. 1, *c*) imbricated, with 1–2 small circular sensoria near base; in *phyllanthi* (fig. 1, *i*) only 1 sensoria is present; segment IV without sensoria. Rostrum as in *phyllanthi*: Stout, reaching beyond middle coxae; distal segment about equal in length to middle segment, pointed apically, with 2 pairs of long setae on the distal part. The small rounded tubercle found on each side of prothorax in *phyllanthi* apparently absent. Cornicles (fig. 1, *d*) very long, nearly cylindrical, straight, very slightly swollen on distal part, broadest at base, stouter than in *phyllanthi*, roughly imbricated, 1·6 times longer than cauda, nearly as long as third antennal segment, not reaching the apex of cauda, with conspicuous and large reticulations on apical quarter and an inconspicuous apical flange. In *phyllanthi*, these reticulations extend on approximately one-tenth of the whole cornicle in the extreme apical region (fig. 1, *j*). Cauda (fig. 1, *e*) fairly long, somewhat swollen, stouter than in *phyllanthi* (fig. 1, *k*), with a more or less rounded apex and with one slight constriction and 2 to 3 setae on the side, stouter

[1] The correct spelling for this specific name is *wikstroemiae* and not *wikstromiae* as published in the original description.

than cornicles. Legs long, slender, with many short setae; trochanters defined from femora; femora stouter than cornicles, slightly imbricated on distal half; tibiae stouter than third antennal segment, with some stout setae on distal half; tarsi imbricated, basal segment with 3 stiff hairs, distal segment with some stiff setae which are longer than body setae; hind tarsi slightly longer than basal part of last antennal segment; empodial setae very long but a little shorter than the claws. Anal plate short, broadly rounded, with some very long setae.

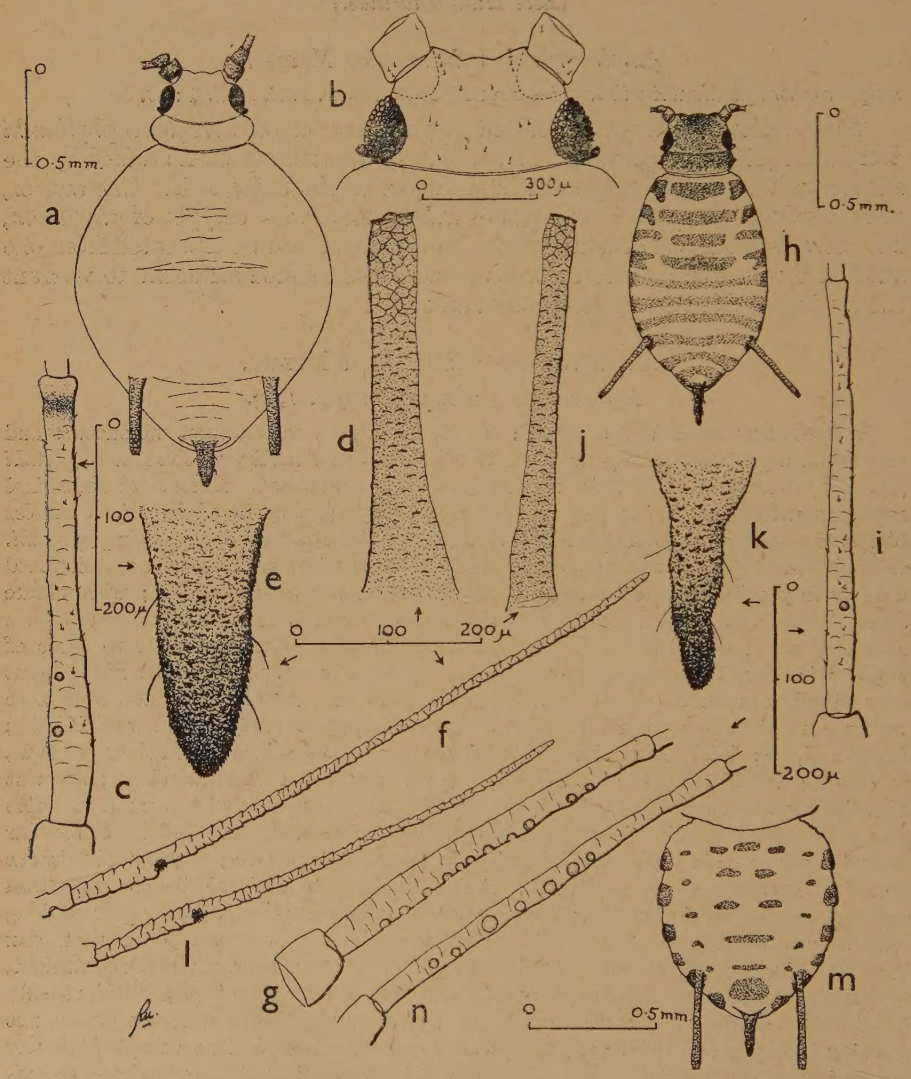


FIG. 1.—*Amphorophora wikstroemiae* Mamet. *Apterous viviparous female:* (*a*) dorsum; (*b*) head; (*c*) third antennal segment; (*d*) cornicle; (*e*) cauda; (*f*) sixth antennal segment. *Alate viviparous female*: (*g*) third antennal segment.

Amphorophora phyllanthi Takahashi. *Apterous viviparous female:* (*h*) dorsum; (*i*) third antennal segment; (*j*) cornicle; (*k*) cauda; (*l*) sixth antennal segment. *Alate viviparous female:* (*m*) dorsum of abdominal segments; (*n*) third antennal segment.

Length of body, about 2 mm.; antenna, about 2·1 mm.; cornicle, 0·44–0·47 mm.; cauda, 0·27–0·3 mm.; hind femur, 0·65–0·72 mm.; hind tibia, 1·14–1·24 mm.

Alate viviparous female.

Head, thorax, antennae and cornicles black. Abdominal segments with large, dusky spots on the sides; these spots less dark than in *phyllanthi*. The dusky spots which are present in transverse rows on the dorsum of *phyllanthi* (fig. 1, *m*) are absent. Wings hyaline; stigma pale. Dorsum not reticulated, with setae similar to those of apterous form. Antennae with a few very short setae; third segment (fig. 1, *g*) with 9 to 11 rather large and circular sensoria arranged in a single row and extending along the whole length of the segment. In *phyllanthi* (fig. 1, *n*) only 4 to 7 similar sensoria are present, mostly on the basal half except the basal part of the third antennal segment. Fourth segment without sensoria. The relative lengths of segments approximately as follows: III, 26; IV, 25; V, 21; VI, 7 + 43. In *phyllanthi*, the corresponding lengths, on the same scale, as follows: III, 28; IV, 21; V, 17; VI, 7 + 31. Cornicles a little shorter than in the apterous form (24 : 27), about 1·6 times as long as cauda, a little shorter than third antennal segment, with large, conspicuous reticulations on apical quarter. In *phyllanthi*, these reticulations extend on about one-tenth of the cornicle in the extreme apical region. Cauda as in the apterous form but less stout. Fore wings imbricated; veins rather stout; media obsolete at base, twice branched; hind wings with normal veins. Legs as in apterous form.

Length of body, about 2 mm.; antenna, about 2·23 mm.; cornicle, about 0·3 mm.; cauda, about 0·25 mm.; hind tibia, about 1·25 mm.; fore wings, about 2·84 mm.

Locality and host: MAURITIUS: Réduit, i.1937 (Type), and Le Pouce Mt., 1939 (Paratype). On tender foliage and twigs of *Wikstroemia viridiflora* Meissn.

Remarks: Readily separable from *Amphorophora phyllanthi* Takahashi by the characters given in the above description and which could be summarized as follows:

A. phyllanthi Takahashi.	*A. wikstroemiae* Mamet.
Apterous viviparous female.	
1. Dorsum of head, thoracic segments and abdominal segments faintly sclerotized.	1. Dorsum of head, thoracic segments and abdominal segments showing no trace of sclerotization.
2. Dorsum reticulated.	2. Dorsum not reticulated.
3. Distal portion of sixth antennal segment about 43μ in length (fig. 1, *l*).	3. Distal portion of sixth antennal segment about 65μ in length (fig. 1, *f*).
4. Cornicles slender and reticulated over apical one-tenth.	4. Cornicles stout and reticulated over apical quarter.
Alate viviparous female.	
1. Dusky spots present in transverse rows on basal abdominal segments.	1. Transverse rows of dusky spots absent on basal abdominal segments.
2. Third antennal segment with 4–7 sensoria.	2. Third antennal segment with 9–11 sensoria.
3. Cornicles with a few large reticulations over apical one-tenth.	3. Cornicles with numerous large reticulations over the apical quarter.

DIAERETUS APHIDUM SP. N. (HEMIPTERA, APHIDIDAE) A PARASITE OF *PTEROCHLORUS PERSICAE* CHOLODKOVSKY ON *PRUNUS PERSICA* IN BALUCHISTAN.

By S. Mukerji, D.Sc., and S. N. Chatterjee, M.Sc.

(*Division of Entomology, Indian Agricultural Research Institute, New Delhi.*)

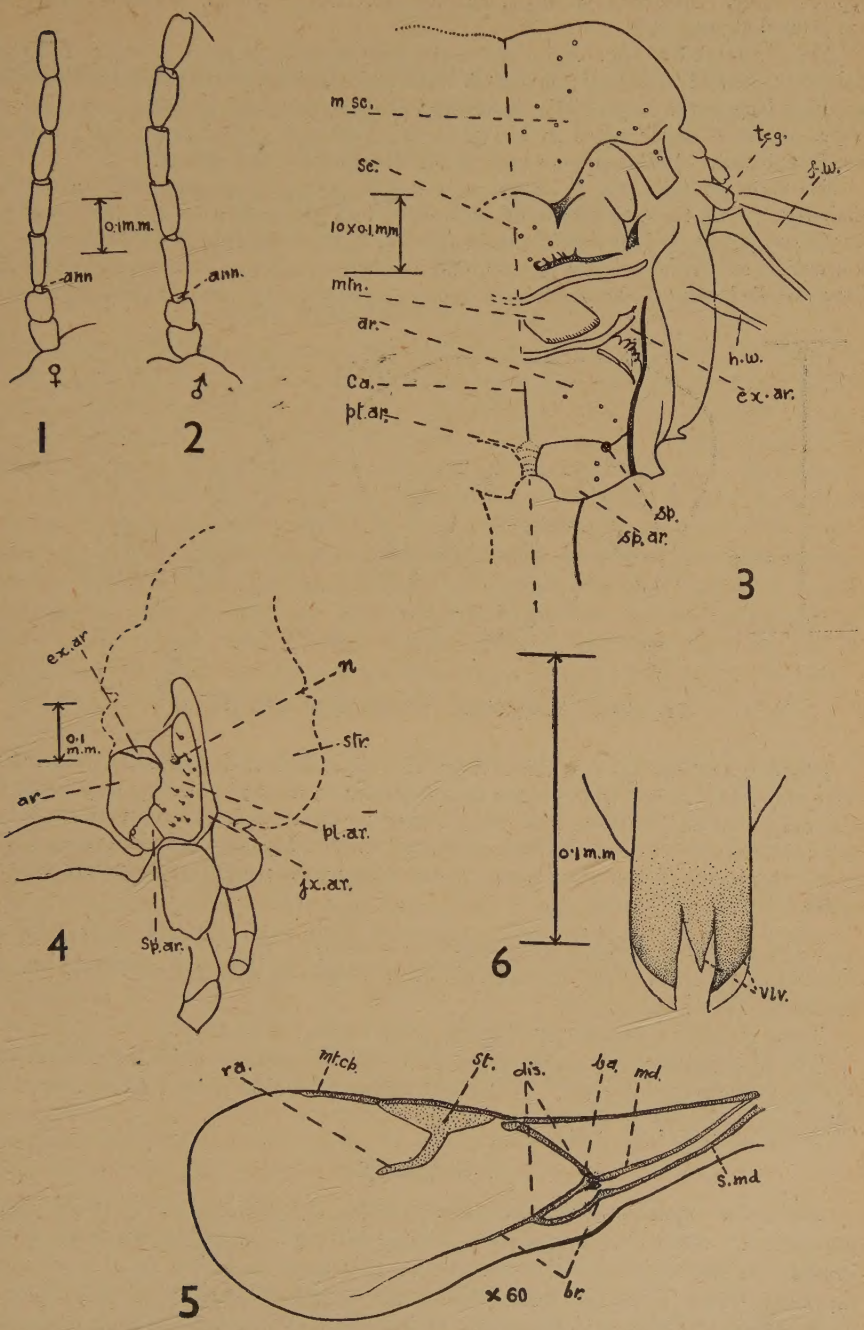
In the family Aphididae the genus *Diaeretus* is one of the least known. The senior author made collections of a species of this genus from the Baluchistan region of Pakistan and the new species is described in the present paper. So far as is known, this is the first record of a species of this genus from India. The authors are indebted to Dr. C. F. W. Muesebeck, of the United States National Museum, Washington, D.C., for expert advice and valuable suggestions for identifying the species.

Diaeretus aphidum sp. n.

Female.—Length 1·8 mm. Antennae shorter than the body ; length of antenna 1·13 mm., slender,15-jointed (including the scape, pedicel and annellus) ; pedicel as thick and nearly as long as the scape, flagellar joints subequal, more slender than the pedicel, each joint being a little longer than the combined pedicel and scape, single annellus (fig. 1, *ann.*) present. Head, viewed from above, slightly broader than the thorax at the tegulae, breadth of the head nearly twice its length ; face smooth, vertex slightly punctate ; mandibles pointed and bidentate (fig. 8 *md.*), maxillary palpi 4-jointed ; eyes ellipsoidal, without hairs. Ocelli (fig. 8 *oc.*) forming a triangle, the postocellar line $\frac{1}{3}$ the length of the ocellocular line (fig. 8 *p.oc.* and *ocl.*).

Thorax (figs. 3 and 4) viewed from above subquadrate ; meso-scutum (*m.sc.*), scutellum (*sc.*) smooth, nearly circular. Propodeum declivous, areola (*ar.*) large with a well-defined median longitudinal carina (*ca.*), dividing the areola into two parts and connecting with a very distinct, small, somewhat diamond-shaped petiolar area (*pt.ar.*) ; the external areola (*ex.ar.*) small, somewhat triangular and situated at the anterior corners of the areola, between the areola and the metanotum (*mtn.*), and separated from the former by an irregular suture ; the petiolar area (*pt.ar.*) bounded laterally by spiracular areas on either side which bear transverse striations, four in number ; spiracular areas (*sp. ar.*) well developed, the spiracles (*sp.*) being circular ; the areolar and spiracular areas sparsely covered with fine hairs ; pleural areas (*pl.ar.*) well defined, large, sub-quadrate and covered with fine hair ; at the proximal end of this area a deep, semicircular, strongly sclerotized notch (*n.*) present ; the juxta-coxal area (*jx.ar.*) almost a linear-band, smooth ; legs slender, tibial spur of the anterior pair of legs well developed as compared with the spurs on the other two legs. Wing stigma (fig. 5, *st.*) longer than broad, radius (*ra.*) short, metacarpus (*mt.cp.*) almost equal in length to radius ; basal vein (*ba*) well developed ; medius (*md.*) indistinct for more than $\frac{3}{4}$ of its length and then somewhat distinct ; submedius (*s.md.*), discoideus (*dis.*) well developed and distinct ; brachial (*br.*) distinct for some distance at base and then very weakly defined ; the submedial cell faint, but first brachial cell well developed. Surface of wing closely ciliated but at the base only sparsely so.

Abdomen longer than the head and thorax combined, a little narrower than the thorax. Ovipositor sheath (fig. 6) darker, slender, tubular, 0·1 mm. long and 0·04 mm. in diameter, consisting of a lateral pair of 3rd valvulae (ovipositor sheath) and a median, sharply pointed shaft (ovipositor) composed of the 1st and 2nd pair of valvulae (*vlv.*) ; the entire ovipositor slightly curved downwards. Size of ovipositor sheath in relation to hind tarsus is 1 : 6

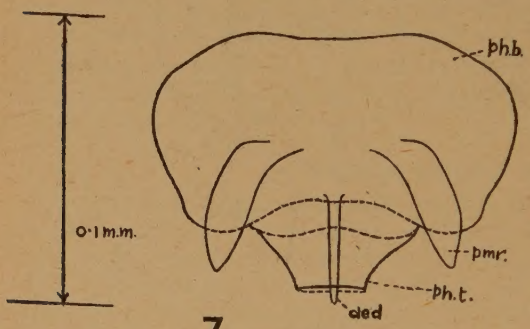


FIGS. 1–6.—*Diaeretus aphidum* sp. n. (1) Female antenna; (2) Male antenna; (3) and (4) Thorax; (5) Wing; (6) Ovipositor sheath.

approximately. Spermatheca single, subglobular. Ovary paired, elongated, ellipsoidal but pointed at both ends.

Male.—Length 1·86 mm. Antennae shorter than the body, length of antennae 1·28 mm., slender, 17-jointed (including the pedicel, scape and annellus), pedicel slightly thinner but nearly as long as the scape. Flagellar joints subequal, more slender than the pedicel and scape, and each nearly equal in length to the combined pedicel and scape; a single annellus present. Abdomen more than double the length of the thorax.

The male genitalia (fig. 7) consist of a tubular slender aedeagus (*aed.*) on a broad phallobase (*phb.*), the aedeagus being ensheathed in a phallotheca (*pht.*); the phallobase simple and bearing only one pair of lateral lobes, the parameres (*pmr.*). Each paramere is a conical structure, broader at base, and somewhat narrower at the distal end. The parameres lie laterad to the phallotheca and are slightly curved inwards towards it.



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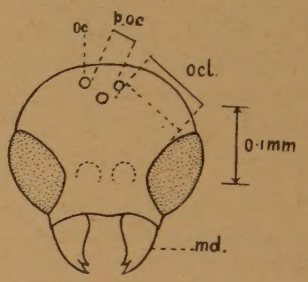

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FIGS. 7–8. *D. aphidum.* (7) Male genitalia; (8) Head.

Diaeretus aphidum sp. n. ♀, differs from *D. oregmae* Gahan, ♀, mainly in the antennae being 15-jointed, pedicel as thick and nearly as long as scape; maxillary palpi 4-jointed, eyes ellipsoidal and hairless, ocelli not forming an equilateral triangle, petiolar area of thorax bearing rather fine transverse striations, anterior legs having well-developed tibial spurs, wing stigma longer than broad, radius rather short; metacarpus nearly equal to radius.

Type ♀ and ♂ with 2 paratypes ♂ (mounted on slide) deposited in the National Collection of the Division of Entomology, Indian Agricultural Research Institute, New Delhi.

Type locality: PAKISTAN, Quetta (environs), Baluchistan.

The specimens were reared from *Pterochlorus persicae* affecting Peach trees during the spring of 1937. A second series was also reared from *Aphis* sp., affecting cabbages in Quetta.

SUMMARY.

Diaeretus aphidum sp. n. (Hemiptera, APHIDIDAE) has been found parasitizing *Pterochlorus persicae* Cholodkovsky, infesting *Prunus persica* (peach) in Baluchistan. The female of this species differs from that sex of the only other Oriental form, *Diaeretus oregmae* Gahan, in the following morphological features: Antennae 15-jointed, 4-jointed maxillary palpi, eyes hairless, ellipsoidal in shape, petiolar area striated, wing stigma longer than broad, and metacarpus being nearly equal to radius. Both sexes of this species have been described in detail.

ETHIOPIAN CULICIDAE: DESCRIPTION OF A NEW *AËDES* FROM EAST AFRICA AND NOTES ON TWO KNOWN *AËDES* WITH WHICH IT MIGHT BE CONFUSED.

By Mrs. E. C. C. van Someren.

(*Division of Insect Borne Diseases, Medical Research Laboratory, Nairobi, Kenya.*)

Aëdes (Aëdimorphus) ngong sp. n.

This species belongs to the *apicoannulatus* group of the subgenus *Aëdimorphus* as defined by Edwards (1941) and is easily separated, on the character of the thoracic ornamentation, from all other members of this group except *A.* (*A.*) *stokesi* Evans and *A.* (*A.*) *haworthi* Edwards. Like *haworthi* it can be separated from *stokesi* by the longer silvery lateral stripes on the anterior half of the scutum. It is extremely difficult to separate it from *haworthi* owing to the variations of scutal ornamentation found. It is possible for one familiar with both species to separate them by the character of the posterior pale lines on the scutum which, in this species, are bold and usually silvery and with many broad scales. These lines on *haworthi* are faint and mainly composed of narrow golden scales, and if broad silvery scales are present these are few in number, except round the bare space where they tend to be more numerous.

The males differ from *haworthi* on the character of the terminalia which are as those of *stokesi*.

The larva differs from *stokesi* by having the comb composed of scales, not fringed spines. It is very similar to that of *A.* (*A.*) *capensis* Edwards, and like *capensis* it differs from the very similar larva of *A.* (*A.*) *kapretwae* Edwards by the shape of the mentum (van Someren, 1946). It has not been found possible to separate it from *capensis*.

The character used to separate the larva of *capensis* from *haworthi* (van Someren, 1946), that is the form of the comb scales, cannot be used to separate this species from *haworthi* as the comb scales are variable and inclined to be intermediate between those of *haworthi* and *capensis*. A differentiating character which was missed in the original description of *kapretwae* and *capensis* is the position of the subventral tuft of the siphon. This species, *kapretwae* and *capensis*, have the subventral tuft placed immediately beyond the pecten and about level with the tip of the last spine. *A. haworthi* has the subventral tuft placed well beyond the pecten, an appreciable gap being present between the tip of the last spine and the base of the tuft.

Female. Head.—Vertex with a pair of wedge-shaped silvery patches composed of broad scales on eye margins in front; the rest of the scales on vertex narrow, dark in front and white on either side behind; erect scales dark. Tori with silvery scales; proboscis and palpi all dark; proboscis sometimes very indistinctly pale below at a half.

Thorax.—Scutum clothed with narrow dark brown scales and silvery markings as follows: a broad silvery stripe on the anterior lateral margins reaching slightly over scutal angles; a pair of small yellow spots, composed of narrow golden scales, about the middle of the scutum, sometimes these spots absent; a pair of lines running back from the median

spots to the scutellum; distinct silvery lines above each wing root and round the bare space. The posterior lines are always bold and usually silvery white; lateral lines composed of narrow scales in front and broad rounded or usually pointed scales behind, sometimes these lines wholly composed of narrow golden scales; lines round bare space and above wing roots usually composed of small rounded silvery scales intermixed with a variable number of narrow yellow scales. Scutellum clothed with broad silvery scales; *apn* with a small patch of silvery scales, *ppn* with a few narrow dark scales on the upper edge and sometimes 2–3 broad silvery scales, but otherwise bare.

Abdomen.—Tergites dark, unbanded, but with white basal lateral spots; sternites dark with broad basal white bands.

Legs.—Dark brown. All femora have silvery white apical spots, that on the fore femora sometimes very small; fore femora all dark anteriorly, and posteriorly with a creamy white line below for the full length and which widens basally onto the anterior surface; mid femora all dark anteriorly, but sometimes with short median line of silvery scales beyond a half, posterior surface creamy white on a little more than the basal half and a pale line for the full length below; hind femora white on the basal two-thirds to three-quarters anteriorly and on the basal half posteriorly, and with a dark dorsal line to base. All tibiae have a white spot at tip, that on hind tibiae twice as long as broad: fore and mid tibiae with a creamy white stripe for full length behind; hind tibiae with a creamy white stripe behind on the middle two-thirds. Fore and mid tarsi with a white spot at the tip of the first segment only, mid tarsi sometimes all dark; hind tarsi with broad apical white bands on segments 1–4, reaching slightly over the joints, 5 all white.

The wings have a small white spot at the base of the costa.

Male.—Differs from the female as follows: Proboscis often distinctly pale below in the middle and sometimes the pale area extends to the upper surface to form a band; palpi as long as proboscis, dark, and often pale below on the shaft, apical two segments hairy and apical segment pale on the basal half; abdominal tergites 3–6 with broad basal silvery bands, eighth tergite all silvery; fore and mid tarsi usually without white spots but the fore tarsi sometimes have a small white spot at the tip of the first segment. *Terminalia* as *stokesi*; basal lobe hairy with about 4 short, stout spines on the upper edge; style narrow with a stout spine on the inner edge and a patch of short hairs associated with this spine; portion of style distal to spine considerably narrowed.

Pupa.—Dorsum of thorax and first 4 segments of abdomen darkened. Lower postocular setae long, single or sometimes bifid; upper single or bifid and about half the length of the lower. Lower posterior antero-thoracic almost as long as lower postocular and with 2–3 branches; upper one-sixth length of lower, single or bifid. Lower anterior antero-thoracic about half the length of the lower postocular and single or with 2–3 branches; upper half the length of the lower and with 2–4 branches. Dorsal seta long, placed between the trumpets and with 3–5 branches. Trumpets short, dark, and widening distally; opening large and oblique. O with 5–8 branches, P much longer and single, R the same length as O and split some distance from the base into 3–5 branches. H and K single, H about one-third the length of K; S and T single, T shorter than S and sometimes bifid. B II–III single and a little longer than the segment; B IV–VI single or sometimes bifid, and much longer than the segment; B VII single and shorter than the segment. C II shorter than B and with 8–12 branches which are sometimes divided again distally; C III with 4–8 branches; C IV–VI progressively shorter on each segment and either single or bifid, C IV usually with 2 and sometimes with 3 branches. A VII half the length of A VIII, plumose, single, or usually with 2 and sometimes with 3 branches. A VIII a little less than half the length of the paddles, plumose, and with 4–5 branches. Paddles pale, oval, with an external buttress on the basal half, a strong mid-rib, and with minute spicules on the external edge and round the apex; seta single and about one-third the length of the paddles.

Larva.—Indistinguishable from that described for *A.* (*A.*) *capensis* (van Someren, 1946).

Head about as long as broad. Antenna about half the length of the head, infuscate for full length, sparsely spiculate, curved and very slightly tapered from base to apex; tuft at about a half and composed of 3–5 finely plumose branches. Setae A, B and C with 7–11, 5–8 and 5–10 plumose branches respectively; *d* small and with 8–9 branches. Mentum small, pentagonal, and with 10–11 teeth on either side of the central tooth, the basal 2 small and widely spaced.

Abdomen.—Comb a patch of 24–32, usually 28, pale scales which are usually rather narrow but some are broad and all with a short fringe. Siphon dark brown; index 3–4 in uncrushed specimens. Pecten reaches to about a half and composed of 22–23 close set dark spines, each with one coarse denticle and 2–3 smaller ones ventrally, and sometimes a few fine dorsal denticles. Subventral tuft placed immediately beyond the pecten, about level with the tip of the last spine, and with 4–6 finely plumose branches which are a little longer than the diameter of the siphon. Anal segment with well developed saddle; lateral seta a little shorter than the saddle and with 2–3 branches; lower caudal seta single, upper with 3–6 branches. Brush with four 6-branched paired setae in the barred area and 2 unpaired tufts outside the barred area. " Gills " pointed, upper 1–2 times the length of the saddle, lower shorter.

Described from holotype, allotype, paedotype, and 17 male and 19 female paratypes and their associated larval and pupal pelts. Larvae collected from tree holes in the Langata forest, Ngong, Nairobi, Kenya.

Notes on the variations of scutal and leg ornamentation found in A. (A.) stokesi *Evans from Western Uganda and* A. (A.) haworthi *Edwards from Nairobi, Kenya.*

Aëdes (*Aëdimorphus*) *stokesi* Evans from Bwamba, Toro district, Uganda. 5 males, 42 females, and many whole larvae.

No bred material is available, but larvae collected from tree holes in this area are as described in this species (Hopkins, 1936), and the male teminalia have been examined and are like those of *stokesi*. The adults vary from the description given by Edwards (1941) as follows:

Silvery lateral stripes on the anterior margins of the scutum often reaching to scutal angle but usually shorter, broad in front and narrow behind; sometimes two small spots of narrow golden scales about the middle of the scutum; the pale lines on the posterior half of the scutum narrow and faint and usually composed of narrow golden scales, but sometimes those round bare space broad; the second fore tarsal segment sometimes has a small white spot at tip.

Aëdes (*Aëdimorphus*) *haworthi* Edwards from Nairobi, Kenya, 2 males, 11 females, and associated larval and pupal pelts.

Material bred from tree holes and identified by larval pelts and male terminalia which agree with the descriptions given by Hopkins (1936) and Edwards (1941). Adults differ from the description as follows:

Usually no pale spot at the tip of the second segment of the fore and mid tarsi, only one specimen showing a very faint spot on the second joint of the fore tarsi; posterior markings of scutum also very variable, the usual form has six pale lines, one over each wing root, a pair of lateral lines reaching forward from scutellum to about one third, and a line on either side of the bare space. These lines are usually composed of narrow golden scales, or sometimes narrow silver scales, with few broad scales among them except round the bare space where the broad scales tend to be more numerous. Sometimes these lines

are considerably reduced and very faint. In other specimens the lateral posterior lines are continued forward to almost a half and very occasionally there are two spots of narrow golden scales in the middle of the scutum.

References.

Edwards, F. W., 1941, *Mosquitoes of the Ethiopian Region* **3**.
Hopkins, G. H. E., 1936, *ibid.*, **1**.
van Someren, E. C. C., 1946, Ethiopian Culicidae : notes and descriptions of some new species and hitherto unknown larvae and pupae (Diptera). *Trans. R. ent. Soc. Lond.* **96** : 109–124.

Book Notice.

Traité de Zoologie : Anatomie, Systématique, Biologie. Vol. 9. *Les Insectes : Paléontologie, Géonémie, Insectes Inférieurs, Coléoptères.* Ed. P.-P. Grassé. 4to. Paris (Masson et Cie), 1949. Pp. 1117, 752 figs., 2 col. plates. Price 4,500 fr.

The first section, on classification, phylogeny, fossil insects, evolution and distribution, is contributed by R. Jeannel, and covers 110 pages, with 109 figures, chiefly after Handlirsch and Martynov. There is a coloured chart summarizing what is known of insect evolution.

The section on Apterygota, by R. Denis, covers 164 pages, with 114 figures. The morphology, biology and systematics of the group are treated at some length.

The section on Pterygota is shared between a number of authors as follows :

Ephemeroptera : R. Despax, 31 pp., 19 figs.
Odonata : L. Chopard, 44 pp., 50 figs.
Dictyoptera : L. Chopard, 53 pp., 40 figs.
Isoptera : P.-P. Grassé, 137 pp., 100 figs.
Zoraptera : R. Denis, 11 pp., 11 figs.
Plecoptera : R. Despax, 30 pp., 30 figs.
Notoptera : L. Chopard, 7 pp., 4 figs.
Cheleutoptera : L. Chopard, 23 pp., 23 figs., 1 col. plate.
Orthoptera : L. Chopard, 106 pp., 107 figs.
Embioptera : R. Denis, 22 pp., 14 figs.
Dermaptera : L. Chopard, 16 pp., 26 figs.
Coleoptera : (General) R. Jeannel, 121 pp., 183 figs.
Coleoptera : (Systematic) R. Paulian, 186 pp., 163 figs., 1 col. plate.

The systematic sections go down to families, and the illustrations in these sections are chiefly of whole insects. There are no keys. Each section has a bibliography, and there is a general index and a contents list.

THREE NEW SANDFLIES (*PHLEBOTOMUS*) FROM EAST AFRICA.

By R. Kirk, O.B.E., M.D., and D. J. Lewis, M.A., F.R.E.S.
(*Stack Medical Research Laboratories, Khartoum.*)

We are indebted to Mr. W. H. R. Lumsden, of the Yellow Fever Research Institute, Entebbe, Uganda, and Mr. J. P. McMahon of the Division of Insect-borne Diseases, Medical Research Laboratories, Nairobi, Kenya, for the opportunity of studying the new species and variety of *Phlebotomus* described below. They were in two collections received for identification.

The type specimens are in the British Museum (Natural History).

Phlebotomus (Phlebotomus) heischi sp. n.

Female.—Antenna : Segment III 0·19 mm., < IV + V, shorter than epipharynx (AIII/E = 0·8); formula 2/III–XIV, ascoids long, those on IV 0·6 as long as segment. *Palp :* Formula 1 (2, 4), 3, 5, relative lengths of segments 1, 2·4, 3·6, 2·3, 4·9. *Epipharynx :* Length 0·23 mm. *Buccal cavity :* Unarmed. *Pharynx :* (Lost) armed. *Wing :* Length 1·5 mm., width 0·45 mm., index (alpha/beta) 0·9, delta + 0·08 mm. *Abdomen :* Erect hairs on tergites I to VII. *Spermatheca :* A sac without annulations.

Male.—Unknown.

Kenya : Wajir, 1943 (*Dr. R. B. Heisch*), 1 ♀.

In the keys of Kirk and Lewis (1946, 1948) this species runs to *P. lesleyæ* from which it is distinguished by having long instead of short ascoids.

Phlebotomus (Sergentomyia) lumsdeni sp. n.

Female.—Length : 1·9 mm. *Antennae :* Missing. *Palp :* Formula 1, 2, 4, 3, 5, relative lengths of the segments being 1, 2·4, 5, 4, 12·4. *Epipharynx :* Length 0·2 mm. *Buccal cavity :* With 15–16 teeth borne on an arc strongly concave posteriorly; the median one or two teeth are small, short and straight, differing from the lateral ones on each side which are very large, pointed and curved so that their points are directed medially and posteriorly, those nearest the median teeth being directed more medially than the extreme lateral ones which are directed more posteriorly; pigmented area faint and indistinct. *Pharynx :* About twice as wide posteriorly as anteriorly, lamp-glass shaped, armed in its posterior sixth with numerous transverse wavy ridges and laterally occasional squamous spines with the points directed medially. *Wing :* Length 1·6 mm., breadth 0·55 mm., alar index 1·8, delta + 0·07 mm. *Spermatheca :* Simple, tubular, poorly chitinized, without annulations.

Male.—Unknown.

Uganda : Bwamba, 1948 (*W. H. R. Lumsden*), 1 ♀.

P. lumsdeni is distinguished from all known species of *Phlebotomus* by the characteristic morphology of the buccal teeth.

Phlebotomus (*Sergentomyia*) *congolensis* var. **medius** var. n.

Female.—Length : 2–2·4 mm. *Antenna :* Segment III (0·12–0·14 mm.) < IV + V, shorter than epipharynx (AIII/E = 0·73–0·87); formula 2/III–XV, ascoids on IV 0·6 as long as segment. *Palp :* Formula 1, 2, 3, 4, 5, relative lengths of segments, 1,

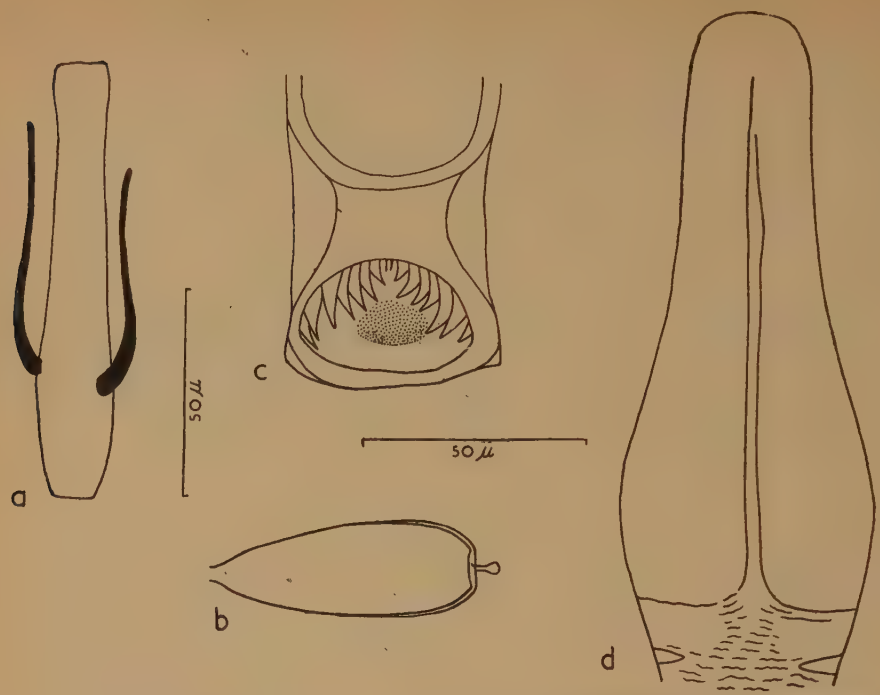

Fig. 1.—*Phlebotomus heischi* sp. n., ♀: (*a*) Fourth antennal segment; (*b*) spermatheca. *P. lumsdeni* sp. n., ♀: (*c*) buccal cavity; (*d*) pharynx.

Fig. 2.—*Phlebotomus congolensis* var. *medius* var. n.: (*a*) Buccal cavity of ♀; (*b*) pharynx of ♀; (*c*) fourth antennal segment of ♀; (*d*) buccal cavity of ♂; (*e*) pharynx of ♂; (*f*) fourth antennal segment of ♂; (*g*) terminalia of ♂.

2·3, 3·4, 5, 8·8. *Epipharynx :* Length 0·13–0·15 mm. *Buccal cavity :* 30–35 pointed teeth on an arc concave posteriorly, the median teeth being shorter than the lateral ones which point slightly inwards towards the mid-line ; pigmented area helmet-shaped. *Pharynx :* About twice as wide posteriorly as anteriorly, with constriction in expanded posterior part which bears numerous well-developed pointed spines. *Wing :* length 1·45–1·6 mm., breadth 0·38–0·42 mm., alar index 0·84–1, delta + 0·1 to 0·12 mm. *Abdomen :* No erect hairs on tergites II–VII. *Spermatheca :* Simple tubular, of *minutus* type, opening into a wide duct.

Male.—Length : 2–2·35 mm. *Antenna :* Segment III (0·13–0·15 mm.) < IV + V, shorter than or equal to epipharynx (AIII/E = 0·8–1) ; formula 1/III–XV, ascoid on IV 0·3 as long as segment. *Palp :* Formula 1, 2, 3, 4, 5, relative lengths of segments 1, 2·7, 3·5, 4·3, 8·6. *Epipharynx :* Length 0·13–0·18 mm. *Buccal cavity :* With about 35 pointed teeth on an arc concave posteriorly, the median teeth being shorter and straighter than the lateral ones ; anterior to this a row of ill-defined nodules ; pigmented area small, irregular, centrally situated, sometimes absent. *Pharynx :* about 1·5 times as broad posteriorly as anteriorly and armed in its posterior portion with irregular rows of small punctiform teeth. *Terminalia :* Coxite (0·2–0·27 mm.) more than twice as long as style which bears four terminal spines and small ventral seta at 0·8 ; paramere (0·14–0·20 mm.) with blunt tip ; penis finger-shaped, strongly curved, with blunt extremity ; lateral lobe 0·17–0·23 mm.

Uganda : Bwamba, 1948 (*W. H. R. Lumsden*), 12 ♀♀, 9 ♂♂.

The pharynx in the female is much less conspicuously armed than in *P. congolensis*, and rather resembles that of var. *distinctus*, but the buccal cavity is quite unlike that of var. *distinctus*.

References.

Kirk, R., and Lewis, D. J., 1946, Taxonomy of the Ethiopian sandflies (*Phlebotomus*). II. Keys for the identification of the Ethiopian species. *Ann. trop. Med. Parasit.* **40** : 117–129.

——— ———, 1948, Taxonomy of the Ethiopian sandflies (*Phlebotomus*). III. New species and records : Alterations and additions to the keys. *Ibid.* **42** : 322–333.

Book Notice.

A Century of Entomology in the Pacific Northwest. By Melville H. Hatch. 4to. Seattle (University of Washington Press), 1949. Pp. 43. Price $1.50.

A chronological account is given of the development of entomology in the northwestern United States, beginning with the "Period of Itinerant Collectors" (1834–80), and ending with the highly-organized professional activities of the present day. Mostly it is a factual story of the men and their work, but interpolated here and there are short descriptions of personalities, and accounts of insect pests prevalent at that period.

Chapter five deals with insect collections located in northwestern towns. There are indexes to insects and to collectors, and a list of literature cited.

NEW SOUTH AFRICAN SIMULIIDAE (DIPTERA).

By Botha de Meillon.
(South African Institute for Medical Research, Johannesburg.)

Simulium merops sp. n.

The material available for description consisted of spirit material so that little can be said about ornamentation.

♂.—Legs without any conspicuous dark banding. Terminalia (fig. 1A, B), sidepieces broad, without any prominent hair tufts; claspers short and broad, suddenly narrowed and with a terminal spine; paramere with two long teeth; ventral plate produced apically and in the shape of an inverted Y; cerci very long.

♀.—Legs with apices and bases of femora and tibiae of all legs and first tarsus of hind leg darkened. All claws with a prominent basal projection. Anterior gonapophyses short with broadly rounded apices; eighth sternite without a sclerotized depression. Spermatheca with prominent reticulations on the surface. Mandible with about 20 teeth on the inner side and none on the outer. Pharyngeal bar unarmed.

Cocoon: As in fig. 1C.

Pupa: Respiratory organ with 18 wavy, more or less subequal, filaments arising from a single base (fig. 1D). Cuticle of filaments towards the base with very marked cross striations.

This new species is obviously related to *tentaculum* Gibbins. Significant differences are: Respiratory organ with 18 and not 20 filaments, the latter larger and stiffer and provided with more pronounced cross striations; ventral plate of male terminalia produced apically, cerci much larger and paramere with at least two teeth. Two other species which have pupal respiratory organs approaching *merops* sp. n. in character are *barnardi* Gibbins, from the Cape Province, and *copleyi* from East Africa. In *barnardi* the pupal respiratory organ has 15 filaments but the male clasper has six teeth near the apex. In *copleyi* there are 17 filaments, but here again the male terminalia differ in having the basal processes of the ventral plate bent outwards at right angles. Gibbins' brief description does not allow of a more detailed comparison.

Holotype ♂, terminalia on a slide, rest of adult in spirit. Cape Province: Malgas River, George, 5.xi.38; in the South African Museum, Cape Town. Paratypes 2 ♂♂, 2 ♀♀ in the South African Institute for Medical Research, Johannesburg.

Simulium natalensis sp. n.

♀.—A species resembling *letabum* De Meillon, with which it shares the unique characters of the presence of a pleural patch of hairs and simple claws. The three females before me are hardly separable from *letabum*, but the pale portions of the legs are covered with a silvery instead of creamy pubescence, and the dark parts are more black than brown. Anterior gonapophyses, as in *letabum*, long and tapering to a fine point. Sternite eight with a sclerotized depression. Spermatheca with faint surface markings, mandible with about 23 teeth on the inner and 9–11 on the outer side, pharyngeal bar with two groups of finely punctate nodules, all as in *letabum*.

♂.—A single male dissected from its pupal case was all that was available for description. The legs appear to be darker than in *letabum*, also dissected from a pupa. Terminalia (fig. 2A) resemble *letabum*, but specific differences are evident; namely, ventral plate

narrower, parallel-sided and notched apically; claspers longer, not narrowed suddenly to a pointed apex; parameral hooks smaller.

Cocoon: As in fig. 2B, resembling that of *letabum*.

Pupa: With breathing organs somewhat reminiscent of *damnosum* (fig. 2C, D). The secondaries arising from the main filament consist of three vertical filaments each branched near the middle and internally of five more or less horizontal filaments of which the three

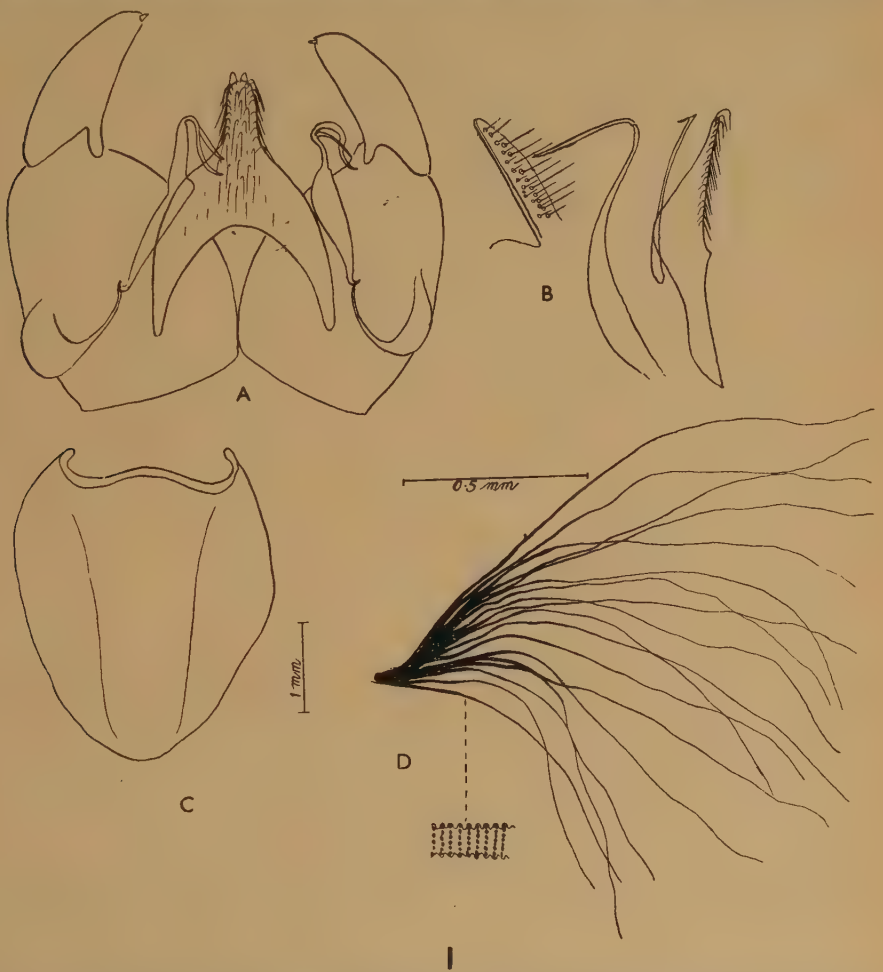

FIG. 1.—*Simulium merops* sp. n.: (A) Male terminalia, ventral view; (B) male terminalia, side view; (C) cocoon, dorsal view; (D) pupal respiratory organ.

median ones bear short branches. The ultimate number of branches in both groups of secondaries is 14. The cuticle of the breathing organ is not prominently marked or sculptured but covered with fine, minute, hairs. In *touffeum* Gibbins, which also has 14 secondary filaments, the method of branching is quite different.

Holotype ♂, paratypes 3 ♀♀ and several pupae. NATAL: Sterkspruit Falls, Champagne Castle, April, 1949 (Coll. B. de M.). In the collection of the South African Institute for Medical Research, Johannesburg.

Simulium narcaeus sp. n.

The material available for description consisted of spirit material only.

♀.—All legs with femur black-tipped, tibia pale medially with apex and base narrowly dark; first hind tarsus largely pale; all other tarsi dark; claws of all legs with a basal tooth. Wing with *Sc* well supplied with macrotrichia throughout its length. Mandibles with about 18 teeth on the inner and 9 on the outer side. Pharyngeal bar unarmed. Anterior gonapophyses with broadly rounded apices provided with a few small teeth internally. Spermatheca globular with a reticulated surface.

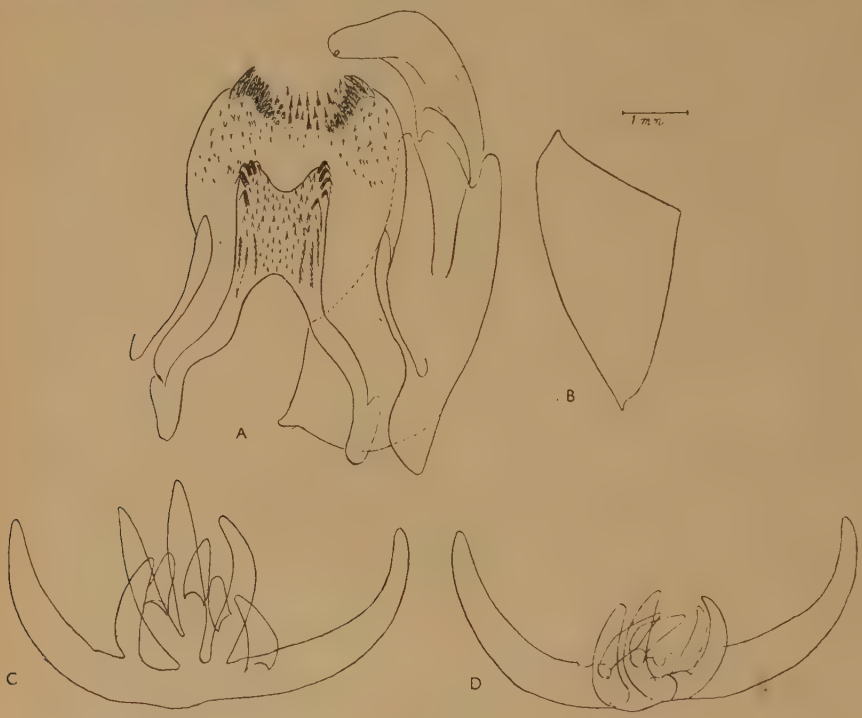

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Fig. 2.—*Simulium natalensis* sp. n.: (A) Male terminalia, ventral view; (B) cocoon, side view; (C) respiratory organ of pupa showing the horizontal group of secondaries only, viewed from the inside; (D) respiratory organ viewed from the outside to show the vertical group of secondaries only.

♂.—Legs as in the female but darker. First hind tarsus somewhat enlarged. *Terminalia* (fig. 3A): Clasper short, somewhat truncated apically where it bears a large terminal spine; paramere with three large hooks; ventral plate very broad with the apical margin deeply excavated.

Cocoon: As in *nigritarsis*.

Pupa (fig. 3B): Respiratory organ with four filaments arising more or less independently from a common base; there is no main stem; the four filaments are not separated basally and the cuticle is faintly marked with cross striations; trichomes short, thick, stiff and spine-like on the head and thorax (fig. 3C).

Habits: Pupae found in very fast running water over rocks.

Holotype ♂, dissected from a pupa. NATAL: Garden Castle, April, 1949. Paratypes, several pupae and specimens dissected from them, same locality and date. All in the collection of the South African Institute for Medical Research, Johannesburg.

The pupal filaments resemble those of *nigritarsis* Coq. and two related and doubtfully distinct species, *brachium* Gibbins and *simplex* Gibbins. The absence of even a short main stem, the close approximation of the filaments basally and their relatively short length will serve ordinarily to distinguish it from *nigritarsis*. The character of the filaments in the latter, however, varies quite appreciably and specimens with filaments approximating to those

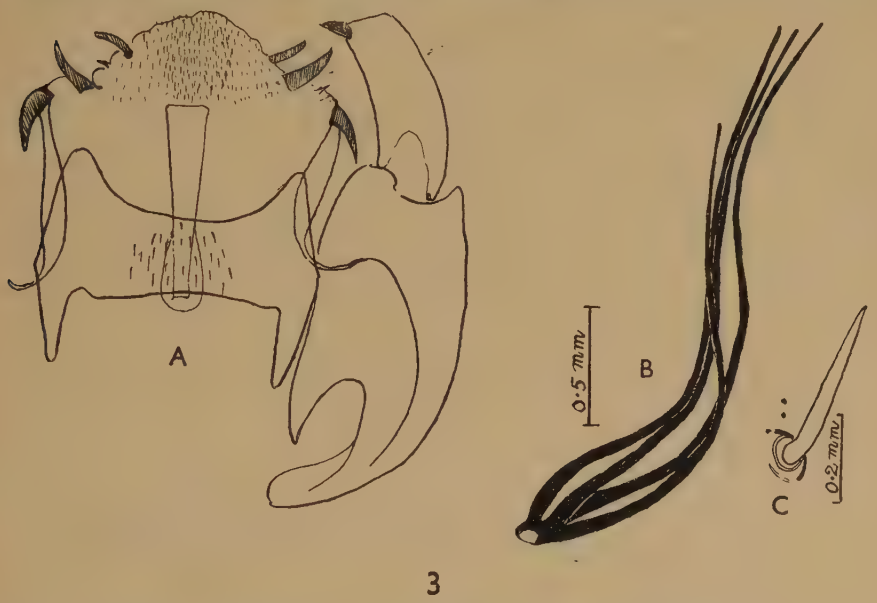

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FIG. 3.—*Simulium narcaeus* sp. n.: (A) Male terminalia, ventral view; (B) pupa respiratory organ; (C) a trichome from the thorax of the pupa.

of the new species have been seen. The one outstanding pupal character which separates the new species from *nigritarsis* and related species, including *rutherfoordi* De Meillon, is the form of the trichomes which are spine-like and not hair-like. This is an easily appreciable character visible at even low magnifications of the dissecting microscope. The male terminalia with the broad apically excavated ventral plate serve to identify the new species immediately. The presence of small teeth on the anterior gonapophyses of the female is also unique as far as I know. These teeth certainly do not occur in *nigritarsis*.

The pupae were identified in the field as *nigritarsis*. Since this species almost invariably breeds in slow moving water, a closer examination was made and this revealed their true identity. This experience will serve to draw attention to the common but undesirable practice of identifying SIMULIIDAE on the character of the pupal filaments only.

A NEW SPECIES OF THE GENUS *DERICORYS* (SERVILLE), (ORTHOPTERA, ACRIDIDAE).

By V. M. Dirsh, D.Sc., F.R.E.S.
(*Anti-Locust Research Centre.*)

Dericorys guichardi sp. n.

♂ (*Type*).—Small, robust, brachypterous.

Antennae shorter than head and pronotum together, thick, with shortened segments. Head robust, strongly raised above the pronotum. Frontal ridge low, widened to clypeus, below ocellus slightly constricted, with a broad, shallow sulcus, which is continuous with concavity of fastigium of vertex; its lateral carinulae strongly raised and continued as carinulae of fastigium. Carinulae of face sharp, sinuate. Fastigium of vertex strongly concave, with sharply raised and sinuated lateral carinulae; with a strong median carinula, which bifurcates in front and continues on occiput. Eyes round, strongly convex.

Pronotum rugulose, saddle-shaped; prozona, in profile, sharply gibbous, its anterior margin straight; metazona convex, its posterior margin acute-angular. Lateral lobe strongly rugulose with irregularly rounded lower margin. Prosternum with sharply raised regular obtuse-angular narrow collar. Mesosternal interspace almost square, slightly broadened forwards. Metasternal interspace broader than long.

Fig. 1.—*Dericorys guichardi* sp. n., male.

Elytron shortened, reaching to apex of third abdominal tergite, its anterior margin with a projection, apex rounded; area mediastina and area scapularis widened; all main veins reduced, simple and strongly incrassate; crossveins in apical part and in discoidal area also strongly incrassate; membrane hard. Wing projects beyond elytron and reaches middle of fourth abdominal tergite. Its main veins and crossveins in anterior part strongly incrassate.

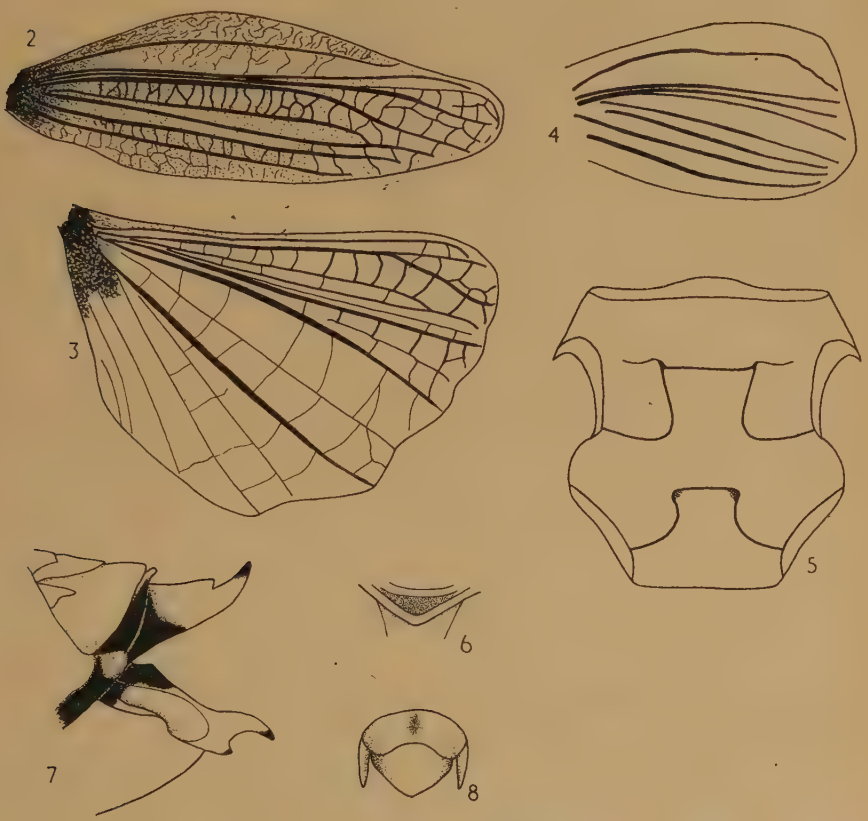
Hind femur slender, its upper carina distinctly serrate, lower one indistinctly serrate; lower lobe of base almost as long as upper one. Hind knee slender, with strongly projected lower lobe. Hind tibia sinuate. Tibial internal spines curved, twice as long as the external ones. Arolium small and broad, half as long as a claw.

PROC. R. ENT. SOC. LOND. (B) 19. PTS. 1–2. FEB. 1950.)

Subgenital plate recurved, convex, with a rounded apical projection. Supra-anal plate simple, broadly triangular with obtuse apex. Cercus short, broad, subconical.

Coloration ashy-grey, with indistinct grey spots; elytron pale ashy; wing colourless; hind tibia grey-bluish, the base and apex lighter than the middle part; tibial spines cream coloured, with black apices.

♀ (*Paratype*).—Larger and more robust than male.



Figs. 2–8.—*D. guichardi*: (2) Elytron of male; (3) wing of male; (4) elytron of female; (5) meso-metasternum of male; (6) prosternal collar of the male; (7) ovipositor; (8) supra-anal plate of male.

Posterior margin of metazona of pronotum less acute. Elytra more reduced and simplified, lobiform, overlap only slightly or not at all; anterior margin with a projection, apex obliquely truncate; main veins reduced and simplified, incrassate; reticulation dense, hard and irregular; membrane hard. Wing shorter than elytron, more reduced than in the male.

Ovipositor short, slender in profile; upper valva from above broad, with a tooth-shaped projection on the apical part of the external margin; lower valva narrow, also with a tooth-shaped projection on the apical part of the external margin. Subgenital plate simple, obtuse-angulate at the apex.

Coloration ashy-grey or pale greyish; elytron more or less ochraceus; abdominal tergites with ochraceous apical fasciae. Base of ovipositor blackish-blue; valvae of

ovipositor very bright red on all sides except pale greyish lower side of the lower valvae; apical and marginal teeth brownish.

Nymph ♂.—Third (?) stage.

Head as in adult, but with shorter antennae. Pronotum in the prozona almost the same as in adult; metazona one-third the length of prozona, subcyclindrical, with truncate posterior margin. Coloration slightly darker than in adult.

Length of body: ♂ 17, ♀ 27; pronotum, ♂ 4, ♀ 6; elytron, ♂ 6·5, ♀ 4·5; hind femur, ♂ 10, ♀ 13·5.

British Somaliland: Between Karin and La Musa, March, 1949, 1 ♀; Hodma, 24.iii.1949, 1 ♂ (Type); Tug Hodma, East of Karin, March, 1949, 2 ♀♀, 1 nymph; Biyo Dader, 15.iii.1949, 1 ♀; Senag Plain, 45 miles East of Berbera, 14.v.1949, 1 ♂, 1 ♀ (*K. M. Guichard*).

Dericorys guichardi differs well from all other species of the genus by its small size; strongly shortened antennae; the prosternal collar instead of a tubercle; strongly shortened, in the female lobiform, elytra; and by the strikingly coloured ovipositor of the female. On the other hand, it is near to the genus *Corystoderes* I. Bolivar, 1936, which differs from *Dericorys* only by lobiform lateral elytra, not overlapping, even in the male, and by a broader hind femur.

The bright coloration of the ovipositor is most unusual in Acrididae. Dr. B. P. Uvarov has drawn my attention to another case known to him: in *Glauia terrea* I. Bolivar, 1912 (Subfam. Pamphaginae), the ovipositor valvae are also coloured red but only on the inside, so that the colour is not visible until the valvae are opened; this character was not mentioned by I. Bolivar in the description of the species. The base of the upper ovipositor valves is coloured indigo-blue in at least five other species of *Dericorys*: *albidula* (Serville), *uvarovi* Ramme, *philbyi* Uvarov, *cyrtosterna* Uvarov and *xenosterna* Uvarov. This striking colour feature may, possibly, play a part during courtship.

Book Notices.

Gall Midges of Economic Importance. By H. F. Barnes, M.A.(Oxford), Ph.D.(London). Vol. VI: *Gall Midges of Miscellaneous Crops.* With a foreword by A. Roebuck, N.D.A. 8vo. London (Crosby Lockwood & Son, Ltd.), 1949. Pp. 229, 14 pls. Price 15s.

This follows the pattern of previous volumes of the series, noticed in these *Proceedings, Series B*, Vol. 18, p. 206.

British Moths and Their Haunts. By L. Hugh Newman, with a foreword by Peter Scott. 4to. Leicester (Edmund Ward), 1949. Pp. 143, 144 half-tone plates. Price 21s.

An atlas of half-tone photographs of 65 British moths with, on the facing page, one or sometimes two photographs of a typical habitat of the species in question.

For each species there is about half a page of explanatory text. The text is decidedly subordinate to the photographs, which attain a high technical and aesthetic standard.

There are indexes of English and Latin names.

THE POSITION OF *ANTHICUS QUADRILLUM* LAF. (COLEOPTERA HETEROMERA) AND RELATED SPECIES IN SOUTHERN AND EASTERN AFRICA.

By J. C. van Hille, Ph.D., F.R.E.S.

(*Department of Entomology, Rhodes University College, Grahamstown, South Africa*).

Introduction.

Anthicus quadrillum is described by M. F. de la Ferté Sénectère (1848), from two species collected by the well-known botanist, F. J. Drège, who travelled widely in South Africa from 1826–1834. Promontorium Bonae Spei is given as the locality.

Anthicus brevisignatus is described by M. Pic (1901*a*) from "Le Cap" as a species similar to *A. quadrillum*, but differing in the generally darker colour and shorter length. This last statement is, however, not confirmed by the data: la Ferté giving for *A. quadrillum* L. 2·2 mm., and Pic for *A. brevisignatus* 2·2–2·4 mm. In a later paper, Pic (1901*b*) describes *A. brevisignatus* var. *subsignatus* from Salisbury (S. Rhodesia) as a lighter colour variety.

H. von Krekich Strassoldo (1914) discusses these species and considers them to be identical. He remarks that neither la Ferté in his description of *A. quadrillum*, nor Pic in his description of *A. brevisignatus*, has noted the enlarged sixth antennal joint of the male. The colour of this species is variable and therefore Krekich does not consider *A. brevisignatus* var. *subsignatus* as a valid variety. As the species is widely spread in Southern Africa and corresponds to the description of *A. quadrillum*, he is almost sure that the names are synonyms. Krekich describes a new variety, *A. quadrillum* var. *consanguineus*, from Madagascar, which differs from the South African form in a number of minor characteristics.

Pic (1913) describes *A. amaniensis* from Amani (Tanganyika) as a more elongate form with narrower prothorax and more regular punctuation than *A. brevisignatus*. At the same time he describes a lighter coloured variety, *A. amaniensis* var. *diversicolor*. Though a difference in size is not mentioned in the description, the length given as about 3 mm. is considerably larger than *A. brevisignatus*.

Pic (1914) describes *A. singularicornis* from Tchania-Kikuyu (Kenya) collected by Ch. Alluaud and R. Jeannel on their East African expedition in 1912. He states that this species also occurs in Madagascar. The enlarged 6th antennal joint is given as a specific character (not as a secondary sex character). No reference is made to either *A. quadrillum* or *A. brevisignatus*, but the species described is stated to have a more dilated prothorax and less elongate elytra than *A. ameniensis* Pic. Length is 3 mm.

In the present paper four species of *Anthicus* are discussed which all conform to the description of *A. quadrillum*. The chief characteristics of this group are the elongate prothorax, which is not bilobed as in the subgenus *Leptaleus*; the dark colour (black or almost black) of the head and elytra,

the last with two pairs of light spots; the colour of the prothorax varying within the species from black to reddish-yellow; legs testaceous but variably pigmented, especially the lower half of the front and hind femur; all legs with two tibial spines of which the outer one of the front leg and both of the middle leg are serrated.

By means of the aedeagus these four species are easily distinguished. It is of a simple form and construction, and consists of a tegmen composed of a dorsal spoon-shaped distal part, formed by the fusion of the lateral lobes or parameres, and a proximal membranous part, of which the margins are chitinized and form a pair of divergent struts. The median lobe is chitinized in different degrees in the species discussed; it is freely movable in the tegmen, the internal sac or praeputial sac is undifferentiated (terms according to Sharp and Muir, 1912).

Anthicus brevisignatus Pic (fig. 1).

The author agrees with Krekich's statement that in view of the variability in colour in the species, the var. *subsignatus* should lapse. The species is easily distinguished from the other similar species by the enlarged 6th antennal joint of the male (fig. 2). It is strange that Pic has not mentioned this

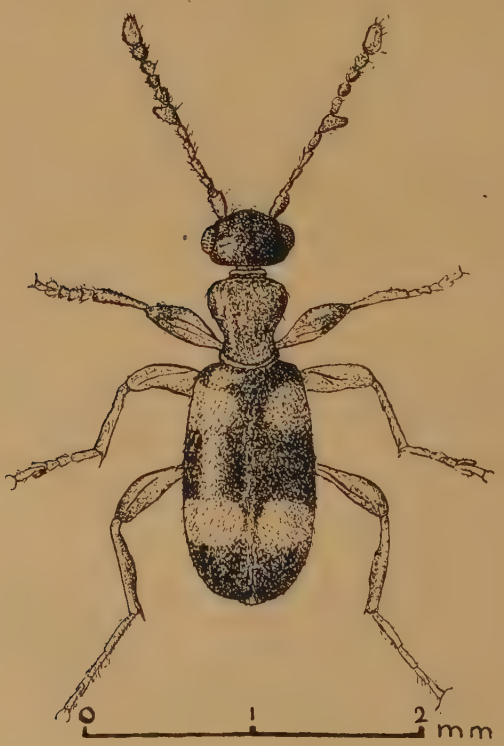


Fig. 1.—*Anthicus brevisignatus* Pic (= *A. singularicornis* Pic).

characteristic in the description. By the kindness of Mr. A. Descarpentries a number of specimens in the Muséum National d'Histoire Naturelle in Paris were lent to the author, among which was the type of *A. brevisignatus* var. *subsignatus* from Salisbury. This specimen, a male, is mounted in such a way that the enlarged part of the antenna, which points naturally downwards, is very difficult to see.

The aedeagus (fig. 3*a*) is recognizable by its tegmen, which has a sinuous dorsal curve and ends distally in a single point.

A number of specimens of *Anthicus singularicornis* from Tchania, Kukuyu and Mt. Kenya now in the Paris Museum are similar to these. The enlarged 6th antennal joint occurs in the male only and the aedeagus is identical. The length of the specimen varies whether the measurement is taken in the natural position with the head inclined, or with the head turned forwards the way in which most specimens are mounted and usually figured. This adds about

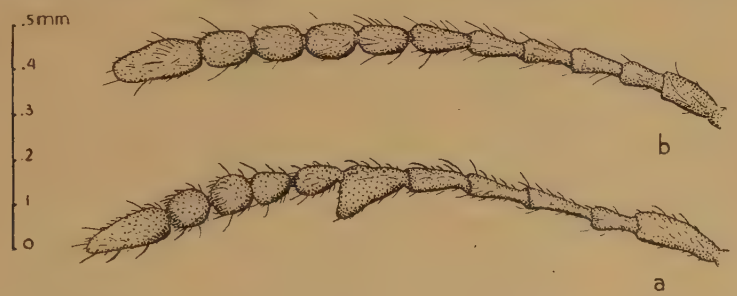


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Fig. 2.—(*a*) Antenna of *Anthicus brevisignatus* Pic ♂ ; (*b*) Antenna of *Anthicus grahami* ♂.

·2 mm. to the length. Measured with the head stretched, the length of this species varies between 2·4 and 2·68 mm. with the average at 2·45 mm. The size 3 mm. given by Pic for the Kenya specimens is inaccurate.

Whether or not this species is *Anthicus quadrillum* cannot be decided without the type. It is of wide distribution and far more common than the other three species discussed below. As Krekich has pointed out, this makes it likely that this was the species collected by Drège.

Localities are all along the Southern and Eastern Coast of Africa from Table Mountain to Kenya, and as far inland as Pretoria and Salisbury. It is common in the Eastern Cape Province where it was frequently collected by Fr. J. O'Neil in Dunbrody (Uitenhage district) and neighbouring districts, and distributed by him over several collections in Southern Africa and Europe, in many of which it is named as *A. quadrillum* la Ferté.

Anthicus grahami sp. n.

Collected on the banks of one of the tributaries of the New Years river which crosses the Cradock road about 7 miles from Grahamstown.

It has the size and appearance of a dark specimen of the previous species, but the 6th antennal joint of the male is not enlarged (fig. 2*b*). The aedeagus differs from *A. brevisignatus* especially in the tegmen which shows a simple convex dorsal curve in the

distal part, and ends in three distal points (fig. 3*b*). A satisfactory characteristic for distinguishing the females of *brevisignatus* and *grahami* cannot be given. On the whole, *grahami* makes a somewhat sturdier impression, but this could not be expressed in figures. The unpigmented parts of *grahami* are of a pale yellowish colour, while those of *brevisignatus* have a more reddish tinge. The colour of these parts of *grahami* would be more likely to be described by la Fertĕ as " jaune sale," the expression used in his description of *A. quadrillum*. Owing to the variability in colour of *brevisignatus* this characteristic is probably not reliable.

The following two species, *zuluensis* sp. n. and (?) *amaniensis* Pic, were collected by light trap at Mkuzi (Zululand) in December, 1945, during the investigation on the influence of D.D.T. spraying on the insect fauna by the

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Fig. 3*a–d*.—Aedeagus of *Anthicus*. (*a*) *A. brevisignatus;* (*b*) *A. grahami* sp. n.; (*c*) *A. zuluensis* sp. n.; (*d*) *A. amaniensis* Pic (?).

Division of Entomology of the Department of Agriculture and Forestry. Only three specimens were collected and they were not at first recognized as belonging to two different species though one is smaller than the other.

Anthicus zuluensis sp. n.

Smaller than the other three species. The two specimens seen are 1·9 mm. The tegmen of the aedeagus has a simple form and ends in a single distal point (fig. 3*c*). The inner lobe is little chitinized.

An external feature which separates this species from the other three, is the length of the 2nd antennal joint which is as long or slightly longer than the 3rd. In all three other species, the 2nd joint is shorter than the 3rd (fig. 4).

Anthicus (?) amaniensis Pic.

The author has seen only one specimen which has the same size and coloration as *grahami* and the darker specimens of *brevisignatus*. It is more slender in general appearance, but the width of the prothorax shows no differ-

ence from those of the last two species. The aedeagus is much narrower than in these, and the tegmen is drawn out in a long distal point with a curved apical hook.

This species may well be correctly named as *Anthicus amaniensis* Pic, but the author has only seen one female specimen from Mt. Kenya in the Paris Museum which is named *A. amaniensis* by Pic and carries a label of Krekich Strassoldo : *A. quadrillum* Laf. = *A. brevisignatus* Pic. This specimen does not show a less enlarged prothorax, more regular punctuation or more elongated elytral form than *A. brevisignatus* Pic, and in the author's opinion is most likely the female of *brevisignatus*.

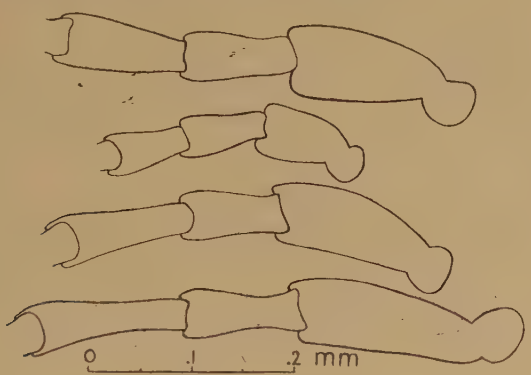

Fig. 4.—From top to bottom the three basal joints of the antenna of *Anthicus brevisignatus* Pic, *A. grahami* sp. n., *A. zuluensis* sp. n. and (?) *A. amaniensis* Pic.

Recently a species very similar to the present was collected by E. T. M. Reid in Blantyre (Nyasaland). The only difference seemed to be that the long drawn out tegmen of the aedeagus did not end in an apical curved hook. More material is required for a definite conclusion.

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La Ferté Sénectère, M. F. de, 1848, *Monographie des* Anthicus. Paris.

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——, 1901*b*, Hylophilides et Anthicides de la Rhodésie. *Rev. Ent.* **20** : 98.

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Sharp, D., and Muir, F., 1912, The comparative anatomy of the male genital tube in Coleoptera. *Trans. ent. Soc. Lond.* **1912** : 477.

Book Notices.

The Ways of a Mud Dauber. By George D. Shafer. 8vo. Stanford (University Press), and London (Geoffrey Cumberlege), 1949. Pp. 78, 10 plates (4 in colour, 6 in half-tone), 9 figs. Price 14s.

The mud dauber is the wasp *Sceliphron cementarium* Drury, and the observations were carried out in an abandoned beehouse in Stanford, California They were started in order to discover the significance of white particles which could be seen through the transparent integument of the larva, and to link them with similar white pellets found lying in empty cocoons. These proved to be crystals of uric acid first formed in the fat body of the larva, and later excreted by the adult wasp soon after emergence.

The book is mainly an account of the steps by which this process was understood, and of the part played by the enzyme uricase. Besides an account of the chemistry involved there are observations of the behaviour of the adult insect while nest-building and hunting.

Larval Food-plants: A Vade Mecum *for the Field Lepidopterist.* Compiled by P. B. M. Allan, M.B.E., M.A., F.S.A., F.Z.S., F.R.E.S. Sm. 8vo. London (Watkins and Doncaster), 1949. Pp. 126. Price 6*s.*

This work covers British and some migrant Macro-Lepidoptera. The food-plants listed are taken entirely from previously-published records, and are carefully restricted to those upon which the larva has been successfully reared up to the imaginal stage. Besides natural food-plants, the list includes those upon which a species may be induced to feed in captivity.

The arrangement of families, genera and species is that in current use at the British Museum. There is an index of families and subfamilies, and one of species. Common names are given for both plants and butterflies.

Käfer und Pilze. By Otto Scheerpeltz and Karl Höfler. 8vo. Wien. (Verlag für Jugend und Volk), 1948. Pp. 351, 9 pls., 19 figs. Price Rm. 54.

A survey of the beetles associated with fungi, as represented in the Wienerwald and the Raxalpengebiet. The book is in four sections, the first of which deals with introductory topics, such as the animal communities harboured by fungi, and the technique of collecting and distinguishing fungi and beetles. Section II is a collecting diary of thirty-five days' collecting in 1946, giving the names of fungi and associated beetles, and field notes.

Section III rearranges the material of the foregoing section into a systematic account of the beetles by families. Included in this section are also keys to the Central European species of certain genera of Staphylinidae (*Proteinus*, *Omalium*, *Oxyporus*, *Bolitobius*, *Gyrophaena*. *Agaricophaena*, *Agaricochara*, *Bolitochara*) and to the local genera of Cisidae. Nine species of *Atheta* and one of *Oxypoda* are described as new.

Section IV summarizes the author's findings on certain general topics: Breeding preferences; chemistry of taste and smell; ecology and community relationships; succession of species. The new species are illustrated in black and white, and many beetles and fungi in colour. There is a long bibliography.

Ant Hill Odyssey. By WILLIAM M. MANN. 4to. Boston (Little, Brown & Co.), 1948. Pp. 338, 6 plates, 5 maps. Price $3.50.

A partial autobiography of the Director of the U.S. National Zoo in Washington, D.C., describing the successive stages of the development of his interest in natural history. His father taught him the rudiments of taxidermy, and while at school in Chicago he made the acquaintance of the Field Museum of Natural History, and then of the Washington Zoo. Collecting became his absorbing interest. Finding that academic qualifications were desirable, he studied at the State College of Washington, and at Stanford University, paying for his courses by the congenial work of collecting and curating, and in this way making the acquaintance of some of the foremost zoologists of his day.

A Stanford expedition to Brazil was his first big venture, from which he returned to be a research assistant at Harvard, where he took a doctor's degree. Further expeditions to Palestine and to the Solomons are described at length. On his return he was offered a post with the Department of Agriculture, taking charge of ants at the U.S. National Museum, at which point the book ends.

Hopkins and Biochemistry, 1861–1947 : *papers concerning Sir Frederick Gowland Hopkins, O.M., P.R.S., with a selection of his addresses and a bibliography of his publications.* Edited by JOSEPH NEEDHAM, F.R.S., and ERNEST BALDWIN, Ph.D. 4to. Cambridge (W. Heffer & Sons), 1949. Pp. ix + 361, 12 plates. Price 18s.

A Commemoration Volume, prepared on the occasion of the first International Congress of Biochemistry, Cambridge, 1949.

After a Foreword by the President of the Congress, A. C. Chibnall, F.R.S., the following sections are presented :

" Autobiography of Frederick Gowland Hopkins," written in 1937, aet. 76.

"Sir F. G. Hopkins ' Teaching and Scientific Influences," by the late Majory Stephenson, F.R.S.

" A Catena of Excerpts from the Scientific Papers," commentary by Leslie J. Harris.

" Sir F. G. Hopkins' Personal Influence and Characteristics," by Joseph Needham, F.R.S., and Dorothy M. Needham, F.R.S.

" Selected Addresses of Sir F. G. Hopkins," fifteen in number.

" Selections from *Brighter Biochemistry.*"

" Roster of the Collaborators, Colleagues and Technical Assistants," by Ivy M. Salisbury and Joseph Needham, F.R.S.

" Bibliography of the Publications of Sir F. G. Hopkins," compiled by Leslie J. Harris, Sc.D., and Malcolm Dixon, F.R.S.

There are twelve plates, mostly photographs at various dates.

The Insect World of J. Henri Fabre. Selected, with introduction and interpretive comments, by EDWIN WAY TEALE. 4to. New York (Dodd, Mead & Company), 1949. Pp. ix + 332. No illustrations. Price $3.50.

Forty of Fabre's studies, selected from his *Souvenirs Entomologiques*, many of them otherwise out of print. Some have been abbreviated, but none has been altered or added to. Each has a short introduction by the present compiler, briefly indicating the contents of the essay, its original place in the series, and other studies on related themes. For the benefit of American readers parallels are drawn with insects familiar in the United States.

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As from January, 1936, the journal *Stylops* is continued as *Proceedings Series B. Taxonomy*. Copies of volumes 1–4 are available at £1 16*s*. 0*d*. each, post free.

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——, 1936, New species of COCCIDAE. *Trans. R. ent. Soc. Lond.* **84** : 901–936.

Titles of periodicals cited are to be abbreviated in the manner indicated in the *World List of Scientific Periodicals, 2nd edition*, 1934.

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,, May 3
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